Utah Department of Environmental Quality

Division of Solid and Hazardous Waste

Fact Sheet

MAY 1996 (9/99)

# HEALTH RISK ASSESSMENT

## at Deseret Chemical Depot, Utah

### WHAT IS A HEALTH RISK ASSESSMENT?

Risk is defined as the likelihood of injury, disease or death resulting from an exposure to hazardous substances. A health risk assessment is a study that uses a mathematical model to show how substances may behave in the environment, and predicts their potential effects on people's health and the environment.

### DESERET CHEMICAL DEPOT HEALTH RISK ASSESSMENT

The Utah Division of Solid and Hazardous Waste recently completed the *Screening Risk Assessment* of the Chemical Agent Munitions Disposal System (CAMDS)[1] and the Tooele Chemical Agent Disposal Facility (TOCDF)[2] at the Deseret Chemical Depot, Utah. The purpose of the Screening Risk Assessment was to evaluate possible health risks from the combustion of chemical munitions[3] at these facilities.

### WHAT IS A SCREENING RISK ASSESSMENT?

A Screening Risk Assessment is a type of health risk assessment that uses both *default* assumptions and site specific data to evaluate risks. Default assumptions are typically more protective than actual conditions. An advantage of using the Screening Risk Assessment is that the risk can be conservatively estimated and calculated before testing commences. The Screening Risk Assessment provides additional assurance of a protective operation.

### WHAT DID THE SCREENING RISK ASSESSMENT LOOK AT?

**Emission Sources.** CAMDS has four furnaces and TOCDF has five furnaces that treat chemical munitions. Emissions are also generated from drying scrubber brine and from the air filter system exhaust. Scrubber brine is generated from cleaning incinerator gas. The air filter system acts as an additional level of protection by cleaning the plant air before it is released to the atmosphere.

**Substances of Concern.** These are substances that may adversely affect people or the environment. These substances fall into three categories:
(a) Substances that do not readily burn (metals).
(b) Substances that do not burn completely (hydrocarbons).
(c) New substances that are formed in the furnace (dioxins).

Specific substances of concern include chemical agents, toxic metals, dibenzo(p)dioxins[4] and dibenzofurans, and polychlorinated biphenyls (PCBs).

**Emission Rates.** The Screening Risk Assessment evaluated a combination of actual CAMDS emissions data and projected emissions for the TOCDF. Projected emissions were obtained from a similar chemical munitions disposal facility (JACADS). The Screening Risk Assessment also accounted for operational disruptions by increasing emissions estimates.

**Human Exposure Scenarios and Pathways.** The Screening Risk Assessment evaluated a number of ways people could come in contact with the substances of concern, and then predicted an exposure. Exposure pathways evaluated include eating contaminated food and breathing contaminated air.

**Uncertainty.** A number of protective assumptions were incorporated into the health risk assessment to compensate for unknowns. For example: Some substances which could be emitted from the stack are unidentified or little is known about their toxicity. To avoid underestimating the health risks, the potential health effects of the unidentified substances were estimated using the known substances.

## HOW WAS THE SCREENING RISK ASSESSMENT DONE?

Reasonable worst case emissions from the combustion sources were estimated. Then, areas where the most emissions would likely be deposited were determined by air modeling. The human health and ecological risks were then calculated.

**Human Exposure Scenarios and Pathways.** In order to predict effects to people's health, the Screening Risk Assessment focused on four scenarios where people with different lifestyles could come in contact with harmful substances. The Screening Risk Assessment combined all of the exposure pathways and assumed homegrown vegetables, meat and fish were contaminated.

(1) Resident Adult Assumptions.

- Resides at the point of maximum off-site emission impact for 30 years.
- Eats homegrown vegetables.

(2) Resident Child Assumptions.

- Resides at the point of maximum off-site emission impact for 6 years.
- Eats homegrown vegetables.

(3) Subsistence Farmers.

Farmer A Assumptions

- Resides at the point of maximum off-site emission impact for half the year for 40 years.
- Eats beef raised in the area.

Farmer B Assumptions.

- Resides at two miles north northeast of the facility boundary all year for 40 years.
- Eats homegrown vegetables.

Farmer C Assumptions.

- Resides 4 miles northwest of the facility boundary all year for 40 years.
- Eats beef raised in the area.

Subsistence Fisher Assumptions.

- Resides and fishes at a potential commercial fishery in Tooele County for 30 years.
- Eats fish from the area.
- Eats homegrown vegetables.

**Potential Health Impacts.** Risk of cancer and other noncancer health problems were assessed under these scenarios.

Due to protective assumptions, the assessment overestimates the actual health risks that would be experienced by a residential or farming population located in the vicinity Tooele Chemical Depot. **The Division has determined, based upon the results of the Screening Risk Assessment, that the emissions from the TOCDF and CAMDS will be safe.**

## WHAT'S NEXT?

Because this Screening Risk Assessment determined that operation of the TOCDF and CAMDS facilities did not pose an increased risk, a number of closely controlled tests (trial burns) for each incinerator and type of chemical agent will be conducted. Actual emissions and constituents of concern will be measured. Following each agent trial burn, a health risk assessment will be conducted to validate the health risks predicted by the Screening Risk Assessment. The test data and the health risk assessment results will also provide better information for making waste management decisions at the facilities.

**Additional Information**

This fact sheet is a summary of the screening risk assessment. If you would like more detailed information or have questions please contact:

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HTTP://WWW.DEQ.STATE.UT.US/EQSHW/CDS/CDS-M-2.HTM

[1] See Chemical Agent Disposal Systems Fact Sheet
[2] See Tooele Chemical Agent Disposal Facility Fact Sheet
[3] See Chemical Munitions Fact Sheet
[4] See Dioxins Fact Sheet